

EMERGENCY ACTION PLAN

BULL HOOK DAM

**DIRECTOR OF PUBLIC WORKS
CITY OF HAVRE
P.O. BOX 231
HAVRE, MT 59501**

SEPTEMBER 2010

If Bull Hook, Scott Coulee Dam is failing or failure seems imminent, call:

All Emergencies	911
Havre Communications Center	265-4361
Hill County Sheriff	265-2512
Disaster and Emergency Services	265-5481 Ext - 283 - Work 945-2420 - Cell

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Evacuees

Roger George	615 32nd Avenue E.	265-8365
Anton Bibeau	3190 7 th Street E.	265-8703
Warren Barger	3116 7 th Street E.	265-7163
David Lohse	3040 7 th Street E.	265-5035
Shawn Keeley	3064 7 th Street E.	
Blaine Ruhkamp	3091 7 th Street E.	265-6619
Greg Childree	3188 7 th Street E.	265-7395
Ted Denning	3159 7 th Street E.	265-8548
Mindi Lark Eller	3181 7th Street E.	265-4761

Those individuals contacted shall be asked to inform their neighbors of the current situation to insure that everyone will be notified.

- E. **Responsibility and Authority.** Pursuant to the Dam Safety Act, Chapter 15 of Title 85, the dam owner is responsible for production, coordination, maintenance, and implementation of this emergency action plan. Extent of owner implementation was defined through coordination of this plan with the county sheriff and disaster and emergency services coordinator.
- F. **Periodic Review/Updating.** The owner will review/update this EAP annually. Review/Update by a professional engineer will be accomplished as required by the dam's operation permit, but no less than every five years.
- G. **Approval.** By my signature, I acknowledge that I or my representative have reviewed this plan, and agree to the tasks and responsibilities assigned herein for my department and/or agency.

Signature Date
Hill County Sheriff's Dept.

Signature Date
Disaster & Emergency Services

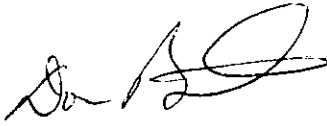
Signature Date
Director of Public Works

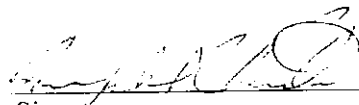
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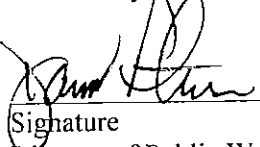
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Signature _____ Date 12/9/10
Hill County Sheriff's Dept.


Signature _____ Date 12-7-10
Disaster & Emergency Services


Signature _____ Date 12/7/10
Director of Public Works

II. NOTIFICATION PROCEDURES

A. Imminent or Actual Failure

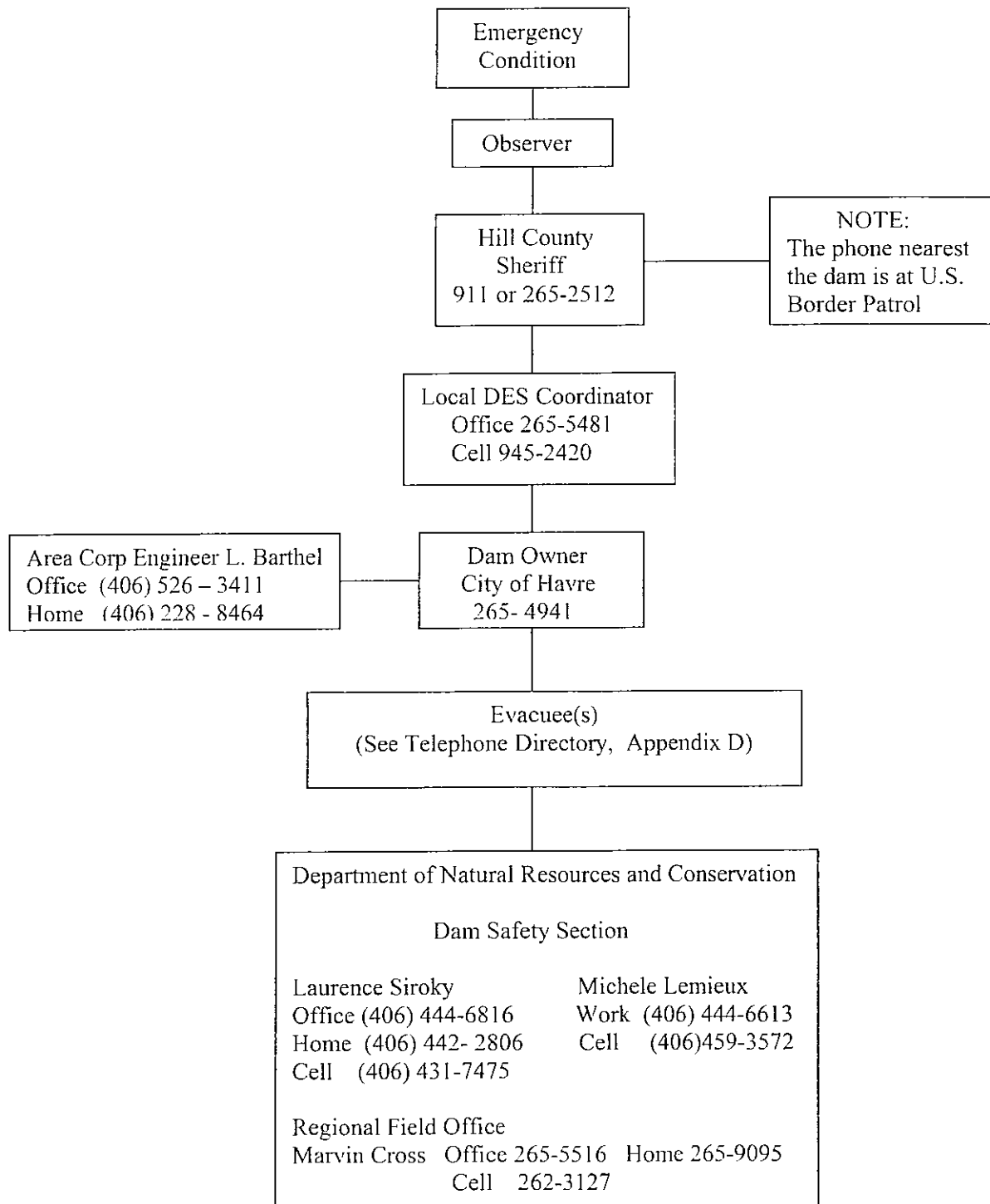
IF BULLHOOK OR THE SCOTT COULEE DAM IS FAILING, TWO THINGS MUST BE DONE IMMEDIATELY:

- (1) Residents in the hazard area downstream from the dam must be evacuated according to the county warning plan, and should be initiated as shown in Figure 1, and
- (2) Any steps that might save the dam or reduce damage to the dam or hazard area downstream should be taken. (Refer to the map in Appendix B to determine the areas that are likely to be inundated if the dam fails).

As dam owner, it is your responsibility to:

1. Call the Sheriff's Dispatch Center (265-2512 or 911) and Disaster and Emergency Services (265-5481 ext. 269), if they have not already been notified. Be sure to say, "This is an emergency." They will call other authorities and the media and begin the warning plan.
2. Warn anyone in immediate danger to evacuate to safety. This includes someone on the dam, directly below the dam, or boating on the reservoir, or downstream evacuees, if so directed by the sheriff.
3. Contact the Disaster and Emergency Services staff at least once every hour. They may request your assistance in evacuating residents.
4. If all means of communication are lost:
 - a. Try to find out why
 - b. Try to get another phone or radio that works.
 - c. Get someone else to try to reestablish communications.
 - d. If these means fail, take care of immediate problems and periodically try to reestablish contact with Disaster and Emergency Services (DES).

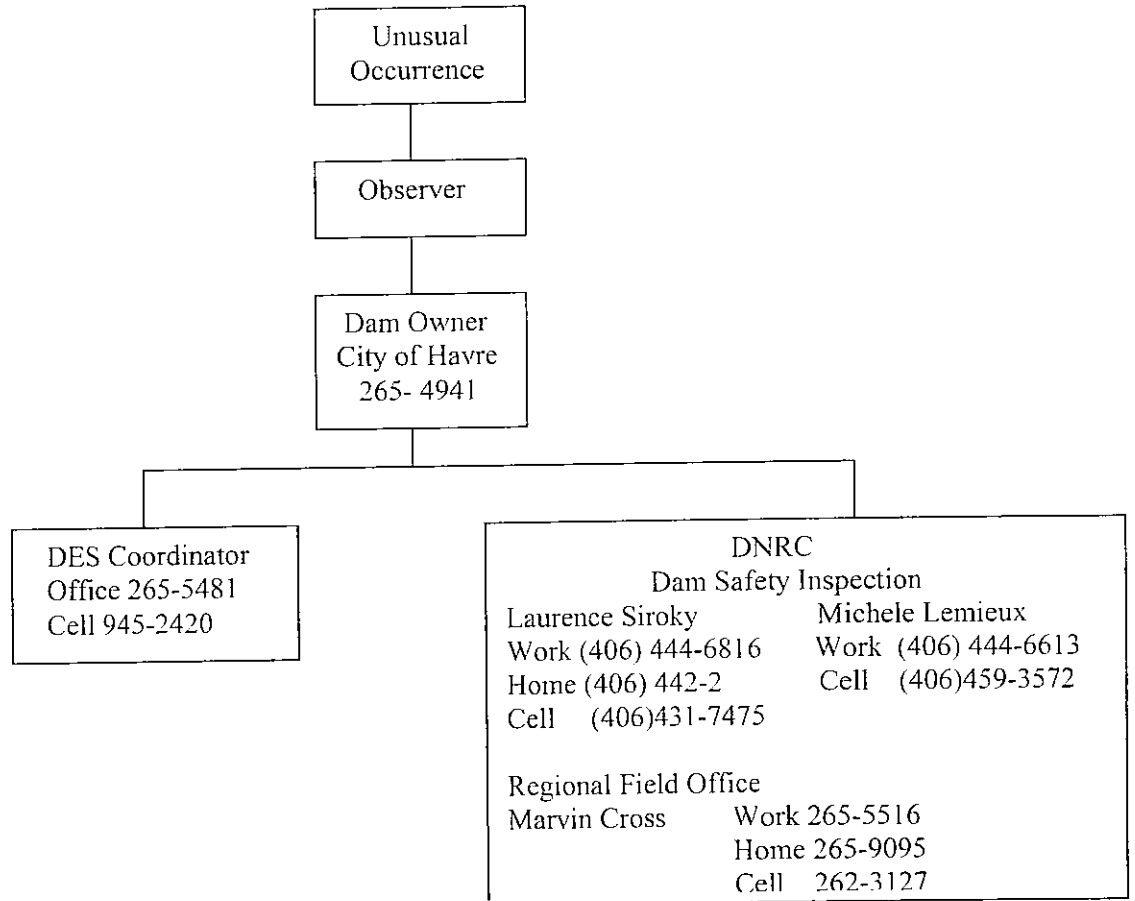
FIGURE 1
BULL HOOK DAM
ACTUAL OR IMMINENT FAILURE
NOTIFICATION FLOWCHART



B. Potentially Hazardous Situation

A potentially hazardous situation is an event or condition not normally encountered in the routine operation of the dam and reservoir. Among the unusual occurrences that may affect the dam are dam embankment problems (see section B.2.), failure of the spillway or outlet works, heavy precipitation or rapid spring snow melt, landslides, earthquakes, erosion, theft, vandalism, acts of sabotage, and serious accidents. These occurrences may endanger the dam, the public, or the downstream valley and may necessitate a temporary or permanent revision of the dam's operating procedures. Help in these situations can be obtained by notifying those people shown in Figure 2.

FIGURE 2
BULL HOOK DAM
POTENTIALLY HAZARDOUS SITUATION
NOTIFICATION FLOWCHART



1. If the dam owner discovers an unusual condition of the dam embankment that could threaten the structure:
 - a. Complete the Dam Incident Report Form in Appendix D.
 - b. Have a qualified engineer inspect the dam as soon as possible to determine whether emergency action is necessary.
 - c. Notify the county Disaster and Emergency Services Coordinator (265-5481 ext. 269) of the potential problem.
 - d. Contact the Dam Safety Program (~~444-6664 or 6613/cell: 431-7475~~) of the Department of Natural Resources and Conservation (DNRC).
2. Among the conditions the dam owner should watch for are:
 - a. Overtopping of the dam by floodwaters
 - b. Loss of material from the dam crest due to storm wave erosion
 - c. Slides on either the upstream or downstream slope of the embankment as evidenced by
 1. Sloughing
 2. Cracking
 3. Bulging
 4. Scarping
 - d. Erosional flows through, beneath, or around the embankment as evidenced by
 1. Excessive seepage
 2. Discoloration of the seepage
 3. Boils on the downstream side
 4. Sinkholes
 5. Changes in the flow from drains
 - e. Failure of outlets or spillways due to clogging or erosion
 - f. Movement of the dam on its foundation as evidenced by
 1. Misalignment
 2. Settlement
 3. Cracking
3. Before calling either an engineer or DNRC to report a problem, the dam owner shall use the form in Appendix D to ensure sufficient information is provided for the engineer to analyze the problems. After talking to the engineer, it may be helpful to document the condition of the dam by making a sketch on the form in Appendix D, showing the extent of the problem. Revise the sketch periodically if the problem develops further. Section III includes further guidelines for courses of action to take mitigate the effect of many problems.

- C. Posting of the Notification Flowchart and Distribution of the EAP.
The Notification Flowchart is posted at the dam. The Hill County Sheriff's Office and the Hill County DES Coordinator have copies of the plan.

III. MITIGATION ACTIONS

Besides normal monitoring of the dam's condition, which is done at least monthly, the owner will provide continuous monitoring and inspection during and after extreme events such as storms and earthquakes. Information on the magnitude of an earthquake or storm can be obtained from the DNRC Dam Safety Program (~~444-6664 or 6613/cell: 431-7475~~). Actions are suggested below to mitigate problems that may develop, but those actions should never be continued at the risk of injury or at the expense of lessening efforts related to evacuation. Monitoring should identify any of the following potential problems.

A. Potential Problems and Immediate Response Actions

1. OVERTOPPING BY FLOOD WATERS

- a. Open outlet to its maximum safe capacity.
- b. Place sandbags along the crest to increase freeboard and force more water through the spillway and outlet.
- c. Provide erosion-resistant protection to the downstream slope by placing plastic sheets or other materials over eroding areas.
- d. Divert flood waters around the reservoir basin, if possible.
- e. Create additional spillway capacity by making a controlled breach in a low embankment or dike section where the foundation materials are erosion-resistant.

2. LOSS OF FREEBOARD OR DAM CROSS SECTION DUE TO STORM WAVE EROSION

- a. Place additional riprap or sandbags in damaged areas to prevent further embankment erosion.
- b. Lower the water level to an elevation below the damaged area.

3. SLIDES IN THE UPSTREAM OR DOWNSTREAM SLOPE OF THE EMBANKMENT

- a. Lower the water level at a rate and to an elevation considered safe, given the slope condition. If the outlet is damaged or blocked, pumping, siphoning, or a controlled breach may be required.
- b. Stabilize slides on the downstream slope by
 1. Weighting the toe area with additional soil, rock, or gravel, and then
 2. Restoring lost freeboard by placing sandbags at the crest.

4. EROSIONAL FLOWS THROUGH THE EMBANKMENT, FOUNDATION, OR ABUTMENTS
 - a. Plug the flow with whatever material is available (hay bales, bentonite, or plastic sheeting if the entrance to the leak is in the reservoir basin).
 - b. Lower the water level until the flow decreases to a non-erosive velocity or stops.
 - c. Place a protective sand-and-gravel filter or boil ring over the exit area to hold materials in place.
5. FAILURE OF APPURTENANT STRUCTURES SUCH AS OUTLETS OR SPILLWAYS
 - a. Implement temporary measures to protect the damaged structure, such as closing an outlet or protecting a damaged spillway with riprap.
 - b. Lower the water level to a safe elevation. If the outlet is inoperable, pumping, siphoning, or a controlled breach may be required.
6. MASS MOVEMENT OF THE DAM ON ITS FOUNDATION (SPREADING OR MASS SLIDING FAILURE)
 - a. Immediately lower the water level until excessive movement stops.
7. EXCESSIVE SEEPAGE AND HIGH LEVEL SATURATION OF THE EMBANKMENT
 - a. Lower the water to a safe level.
 - b. Continue frequent monitoring for signs of slides, cracking or concentrated seepage.
8. SPILLWAY BACKCUTTING, THREATENING RESERVOIR EVACUATION
 - a. Reduce the flow over the spillway by fully opening the main outlet.
 - b. Provide temporary protection at the point of erosion by placing sandbags, riprap materials, or plastic sheets weighted with sandbags.
 - c. When the inflow subsides, lower the water to a safe level.
9. EXCESSIVE SETTLEMENT OF THE EMBANKMENT
 - a. Lower the water level by releasing it through the outlet pumping, siphoning, or a controlled breach.
 - b. If necessary, restore freeboard, preferably by placing sandbags.

B. Emergency Supplies and Resources

Soils in the vicinity of Bull Hook and Scott Coulee Dams are mostly glacial till lean clay, which has been shown to be suitable fill, or repair materials in an emergency.

C. Local Contractors and Engineers

Local Contractors:

Baltrusch Construction: 265-5488
Hill County Road Department: 265-8507
Patrick Construction: 265-3351
Verploegen Excavation: 265-2284
Lakeside Construction: 265-9401
C & C Excavation: 265-9901

Engineer:

Milk River Engineering: 265-5080

Material Suppliers:

- a. Sand and Gravel
 - Havre Sand and Gravel: 265-5488
 - Patrick Construction: 265-3351
 - Verploegen Excavation: 265-2284
- b. Concrete
 - Havre Ready Mix and Concrete: 265-6789
- c. Electrical
 - Syntec Technologies: 265-5900

APPENDICES

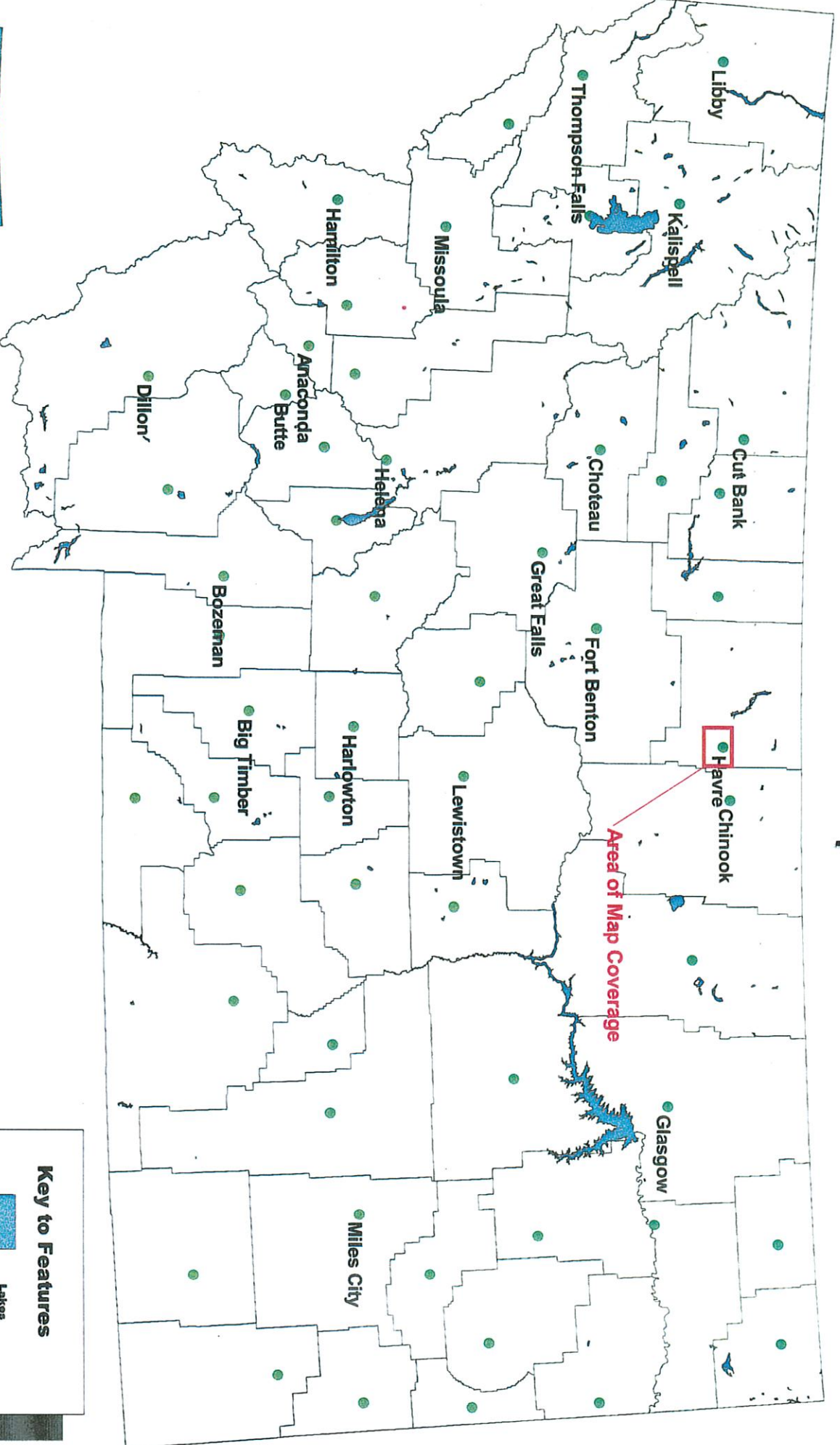
PERTINENT DATA

Item No.	Subject	Bull Hook - Scott Coulee	
<u>GENERAL</u>			
1	Location of dam	1 mi. S. of Havre, Mont.	
2	River and river mile	Bull Hook Cr - Scott Coulee	
3	Drainage area (Sq. Mi.)	54	
4	Reservoir length (mi.)	Normally dry	
5	Location of Damtender	Ft. Peck Dam	
6	Travel time to Mo. River	--	
7	Max. discharge of record	--	
8	Project cost (1)	\$1,837,200	
<u>DAM AND EMBANKMENT</u>			
9	Top of dam - Ft. MSL	2613.3 (B.H.)	2613.3 (S.C.)
10	Length of dam Ft.	1900 (B.H.)	1500 (S.C.)
11	Height of dam Ft.	73 (B.H.)	53 (S.C.)
12	Stream bed Ft. MSL	2540 (B.H.)	2560 (S.C.)
13	Abutment formation	Glacial Till. Lean Clay	
14	Type of fill	Rolled earth	
15	Fill quantity in cu. yds	1,300,000	
16	Date of closure	Oct. 1955	
17	Date of initial fill (Base F.C.)	--	
<u>SPILLWAY</u>			
18	Discharge capacity - cfs	25,200 cfs at el 2605	
19	Crest elev. Ft MSL	2593.0 (B.H.)*	2586.0 (S.C.)
20	Width - Ft.	--	
21	Gates, number, size, type	Ungated earth channels	
		* Notch in BH to 2583	
<u>RESERVOIR ELEV. AND AREA</u>			
22	Maximun pool	2605.0 (B.H. & S.C.)	
23	Top of flood control pool	2593.0 (B.H. & S.C.)	
24	Top of Multipurpose pool	None	
25	Top of inactive pool	None	
<u>STORAGE ZONES - ELEV. CAPACITY</u>			
26	Surcharge	Total-(B.H. & S.C.)	
27	Flood Control	2593.0-2605.0	4000AF
28	Multipurpose	2540.00-2593.0	6500AF
29	Inactive	None	
30	Gross (Top of flood control pool)	None	
		6500AF	
<u>OUTLET WORKS</u>			
31	Number and size - conduits	1 - 30 in. RCP - Bull Hook	
		1 - 30 in. RCP - Scott Coulee	
32	Conduit length - Ft.	393 ft. - Bull Hook	
		286 ft. - Scott Coulee	
34	Number - size - type gates	1 - 24 in. valve-Bull Hook	
		1 - 24 in. valve-Scott Coulee	
35	<u>POWER INSTALLATION</u>	None	

APPENDIX B

Inundation & Evacuation Maps

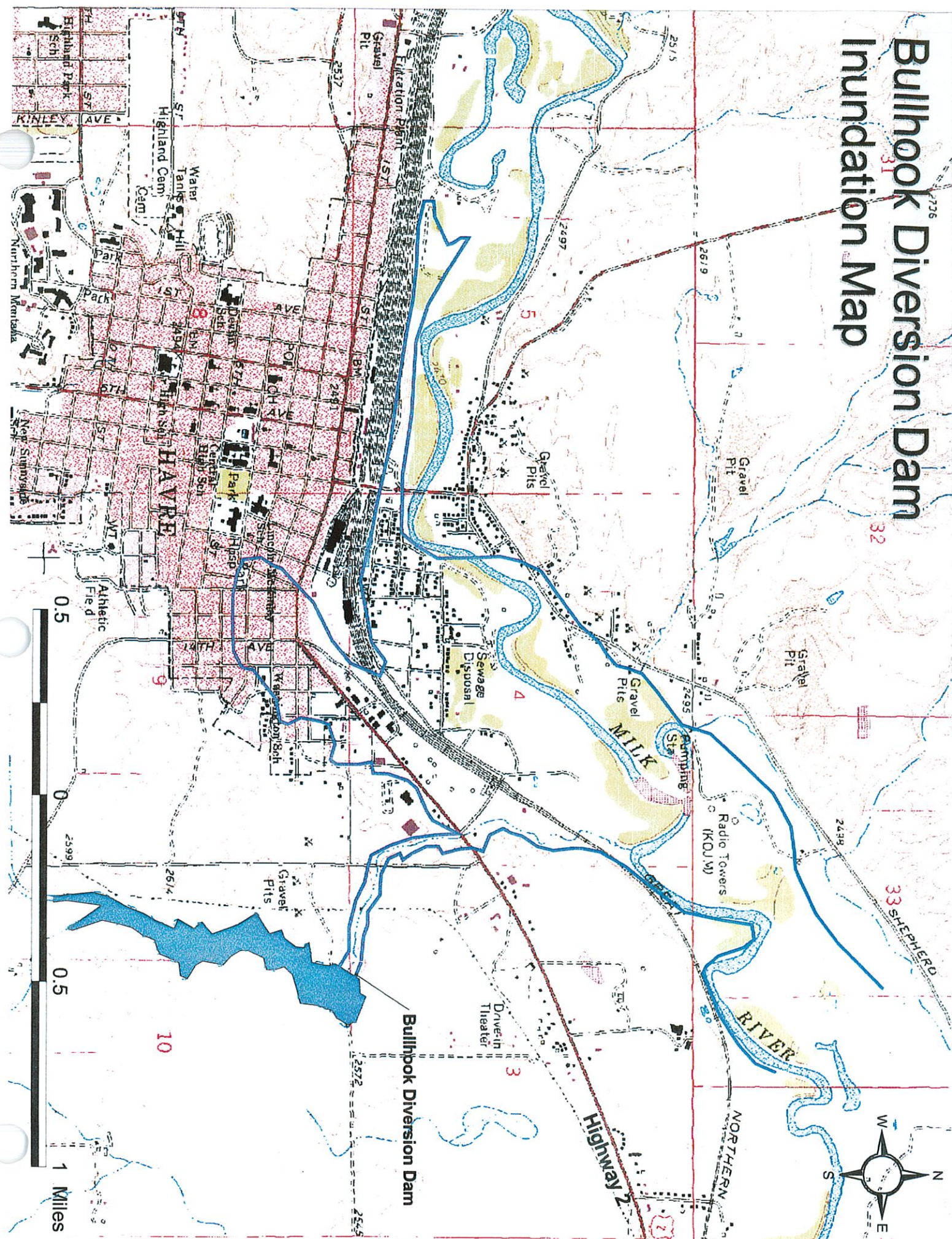
Bulhook Dams/Scott Coulee Overview Map



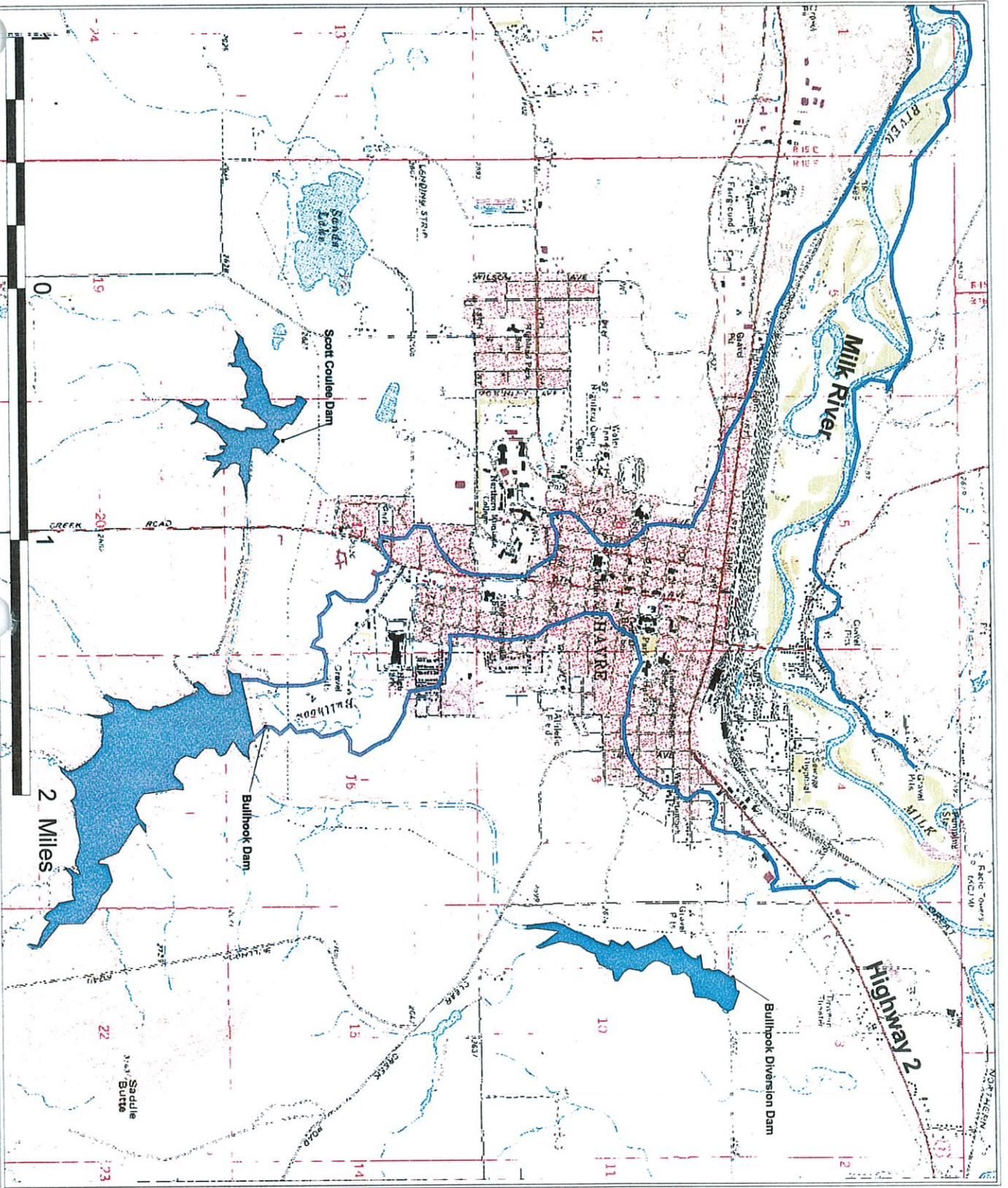
Key to Features

- Lakes
- Cities
- Counties

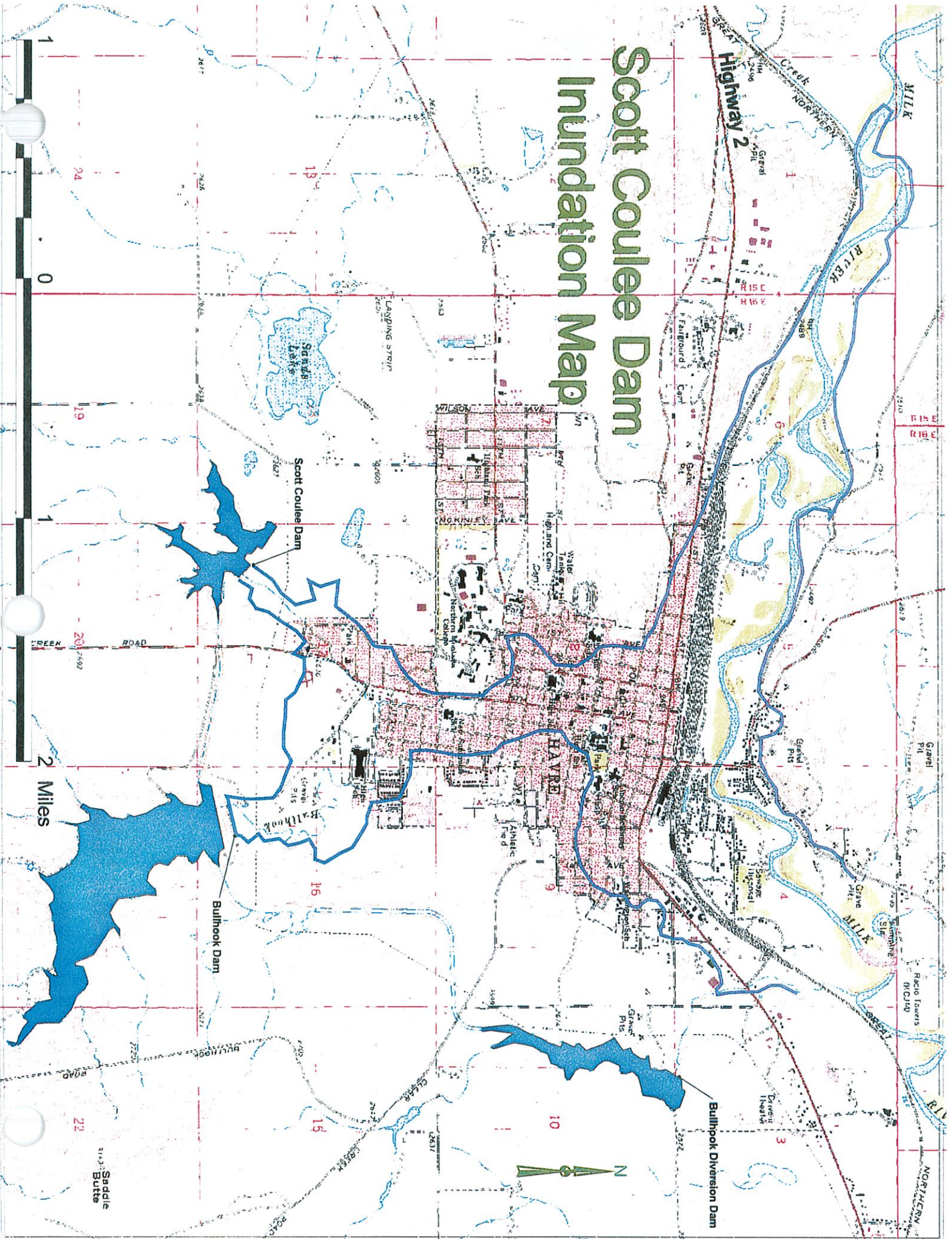
Bullhook Diversion Dam Inundation Map



Bullhook Dam Inundation Map



Scott Coulee Dam Inundation Map



APPENDIX B
Telephone Directory

PRIORITY ONE

1. Havre Communications Center
City Police Dispatch (24 Hour Service) 911 or 265-4361

Sheriff
Hill County (24 Hour Service) 265-2512
2. DES Coordinator
Hill County 265-5481 ext. 461
Joe Parenteau..... 945-2420
City of Havre – Public Works 265-4941
David Peterson 265-3076/390-1024
3. Evacuees
The evacuation area of Bull Hook & Scott Coulee extends throughout the lower areas of the City of Havre. US Highway No. 2 and Burlington Northern Santa Fe. Inundation and Evacuation maps are located in Appendix E of this plan.

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PRIORITY TWO

4. Local Engineers:
Milk River Engineering 265-5080
Seimens Engineering Company..... 262-9725
5. Montana Department of Natural Resources and Conservation (DNRC):
Dam Safety Engineers:
Laurence Siroky..... Office (406) 444-6816
Home (406) 442-2806
Cell (406)431-7475

Michele Lemieux..... Office (406) 444-6613
Cell (406) 459-3572

Regional Field Office

Marvin Cross Office (406) 265-5516
Home (406) 265-9095
Cell (406) 262-3127

6. NATIONAL WEATHER SERVICE:

Helena (406) 449-5204
Great Falls (406) 453-2081
Billings (406) 657-6988

7. BUREAU OF LAND MANAGEMENT (406) 657-6561

8. MONTANA DEPARTMENT OF FISH, WILDLIFE & PARKS (406) 444-2535

APPENDIX D

Dam Incident Report Form

DATE: TIME:

NAME OF DAM:

STREAM NAME:

LOCATION:

COUNTY:

OBSERVER:

OBSERVER TELEPHONE:

NATURE OF PROBLEM:

LOCATION OF PROBLEM AREA (Looking Downstream):

EXTENT OF PROBLEM AREA:

FLOW QUANTITY AND COLOR:

WATER LEVEL IN RESERVOIR:

IS SITUATION WORSENING?

EMERGENCY STATUS:

CURRENT WEATHER CONDITIONS:

ADDITIONAL COMMENTS:

APPENDIX E

Emergency Action Plan Distribution List

<u>PLAN HOLDER</u>	<u>NUMBER OF COPIES</u>
Dam Owner, City of Havre	2
Hill County Sheriff.....	1
Local DES Coordinator	1
DNRC Dam Safety Program	1
DNRC Havre Regional Office	1
Army Corps of Engineers, Fort Peck	1